



VIPER HS
RIFLESCOPE

VORTEX
THE FORCE OF OPTICS™

OWNER'S MANUAL
4-16x50
4-16x44
2.5-10x44



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RIFLESCOPE

The Vortex Viper HS Riflescopes

Specifically designed for the most discriminating hunters and shooters, the Viper® HS series of riflescopes offer the highest levels of performance and reliability. With features such as 4x optical zooms, generous long eye relief, and ruggedly constructed 30 mm main tubes. The Viper HS riflescopes are ready for any situation.



RIFLESCOPE ADJUSTMENTS

Reticle Focus

Vortex Viper HS riflescopes use a *fast focus* eyepiece designed to quickly and easily adjust the focus on the riflescope's reticle.

To adjust the reticle focus:

- Look through the riflescope at a blank white wall or up at the sky.
- Turn the eyepiece focus knob in or out until the reticle image is as crisp as possible.
- **Note:** Try to make this particular adjustment quickly, as the eye will try to compensate for an out-of-focus reticle.



Adjust the reticle focus

Once this adjustment is complete, it will not be necessary to re-focus every time you use the riflescope. However, because your eyesight may change over time, you should re-check this adjustment periodically.

Warning

Looking directly at the sun through a riflescope, or any optical instrument, can cause severe and permanent damage to your eyesight.

Windage and Elevation Adjustments

The Viper HS riflescope incorporates adjustable elevation and windage dials with audible clicks. Each audible click moves the bullet's point-of-impact 1/4 of a minute of angle (MOA).

1/4 MOA closely corresponds to 1/4 inch at 100 yards, 1/2 inch at 200 yards, 3/4 inch at 300 yards...taking four (4) clicks to move the bullet's point-of-impact approximately one inch at 100 yards.

How to adjust windage and elevation settings

Begin adjusting the windage and elevation settings by first removing the outer covers. Then, move the turrets in the direction you wish the bullet's point-of-impact to change. To make the adjustments, dial the adjustment knob in the appropriate direction (up/down or left/right) as indicated by the arrows.



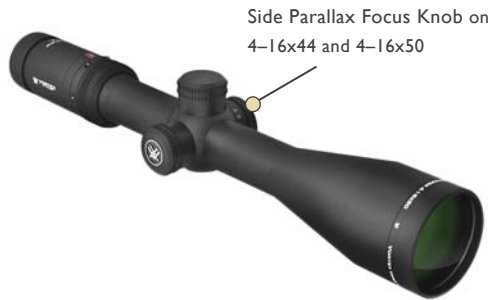
To adjust settings, turn knobs

- Up / Down
- Left / Right

After sight-in, you can re-align the zero marks on the turret knobs with the reference dots if you wish (see *Resetting Adjustment Dials with Zero Reset* section). Replace outer covers when done.

Side Focus Parallax Adjustment

Viper HS 4-16x44 and 4-16x50 riflescopes use a side focus parallax adjustment which provides maximum image sharpness and eliminates parallax error. The Viper HS 2.5-10x44 riflescopes do not use side focus parallax adjustments and are pre-focused at a distance of 100 yards.



Parallax is a phenomenon that results when the target image does not quite fall on the same optical plane as the reticle within the scope. When the shooter's eye is not precisely centered in the eyepiece, there can be apparent movement of the target in relation to the reticle, which can cause a small shift in the point of aim. Parallax error is most problematic for precision shooters using high magnification.

Setting the side focus:

- Be sure the reticle is correctly focused (see *Reticle Focus*).
- As accurately as possible, match the yardage number (distance you are shooting) on side focus parallax adjustment knob to the indicator arrow on the scope body.
- Check the setting for accuracy by looking through the scope to verify image sharpness and, at the same time, look for reticle shift while moving your head back and forth. The setting is correct if there is no apparent movement between the reticle and target while your head is moving back and forth. If there is apparent movement, adjust the focus knob slightly until the movement is eliminated.



Adjust the side parallax knob

When properly set, the target image should be sharp and crisp.

Variable Power Adjustments

To change magnifications, turn the magnification ring to the desired level. The Vortex *MagView* fiber optic magnification indicator will provide a low light reference for magnification level.



Magnification and Reticle Subtension

The reticle subtensions listed on vortexoptics.com or in the reticle manual are only valid at the highest magnification of the riflescope. However, by understanding the relationship of magnification and subtensions, the shooter can still easily calculate ranging, holdovers and wind drift at partial magnifications (**2x**, **3x** and **4x** markings). Some HS models use a *Subtension Multiplier Scale*.

- If magnification is set to full power (**1x** on dial), subtension values will be the spec listed.
- If magnification is set at half of the full power (**2x** on dial), subtension values will be two times the spec listed.
- If magnification is set at a third of the full power (**3x** on dial), subtension values will be three times the spec listed.
- If magnification (**4x** on dial) is set at a quarter of the full power, subtension values will be four times the spec listed.

RIFLESCOPE MOUNTING

To get the best performance from your Vortex Viper HS riflescope, proper mounting is essential. Although not difficult, the correct steps must be followed. If you are unsure of your abilities, it would be best to use the services of a qualified gunsmith.



Rings and Bases

Mount an appropriate base and matching rings to your rifle according to the manufacturer's instructions. The Vortex Viper HS riflescopes require 30mm rings.

Use the lowest ring height that will provide complete clearance of scope and rifle—avoiding any contact with barrel, receiver, bolt handle or any other part of the rifle. A low mounting will help assure proper cheek weld, aid in establishing a solid shooting position, and promote fast target acquisition.

Centering of the Reticle

If you wish to re-center the reticle to the center, this can be done easily:

- Turn the windage or elevation dial as far as possible in either direction. *Do not force the dial. As soon as any any resistance is felt, stop turning.*
- Carefully count the dial rotations while turning the dial back in the opposite direction. *Stop turning as soon as resistance is felt.*
- Turn the dial the other direction to half the amount of rotations counted in step one.

Complete this procedure for both windage and elevation dials to approximately center the reticle.

Eye Relief and Reticle Alignment

After installing the bottom ring halves on the mounting base, place the riflescope on the bottom ring halves and loosely install the upper ring halves. Before tightening the scope ring screws, adjust for maximum eye relief to avoid injury from recoil:

- Set the riflescope to the middle of its magnification range.
- Slide the riflescope as far forward as possible in the rings.
- While viewing through the riflescope in a normal shooting position, slowly slide the riflescope back towards the shooter's face—paying attention to the field of view. *Just as the full view is visible, stop.*
- Without disturbing the front-back placement, rotate the riflescope until the vertical crosshair exactly matches the vertical axis of the rifle. Use of a reticle leveling tool, a weight hung on a rope, or an adjustable set of feeler gauges will help with this procedure.
- After aligning the reticle, tighten and torque the ring screws down per the manufacturer's instructions.



Use of an adjustable set of feeler gauges between a one-piece base and flat bottom section of the riflescope to square the riflescope (and reticle) to the base.

Bore Sighting

Initial bore sighting of the riflescope will save time and money at the range. This can be done by using a mechanical or laser bore sighter according to the manufacturer's instructions or by removing the bolt and sighting through the barrel on some rifles.

To visually bore sight a rifle:

- Place the rifle solidly on a rest and remove the bolt.
- Sight through the bore at a target approximately 100 yards away.
- Move the rifle and rest until the target is visually centered inside the barrel.
- With the target centered in the bore, make windage and elevation adjustments until the reticle crosshair is also centered over the target.



Visually bore-sighting a rifle.

Final Range Sight-In

After the riflescope has been bore-sighted, final sight-in should be done at the range using the exact ammunition expected to be used while shooting. Sight in and zero the riflescope at the preferred distance. 100 yards is the most common zero distance, although a 200 yard zero may be preferred for long range applications.

Be sure the reticle is in focus (see Reticle Focus) and set the parallax adjustment to match the distance being used for sight-in:

- Following all safe shooting practices, fire a three-shot group as precisely as possible.
- Next, adjust the reticle to match the approximate center of the shot group (see section on *Windage and Elevation Adjustment*).

Note: If the rifle is very solidly mounted and cannot be moved, simply look through the scope and adjust the reticle until it is centered on the fired group.

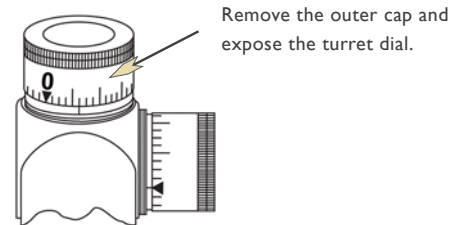
- Carefully fire another three-shot group and see if the bullet group is centered on the bullseye.

This procedure can be repeated as many times as necessary to achieve a perfect zero.

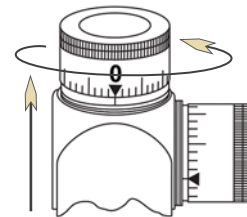
Resetting Adjustment Dials with Zero Reset

Viper HS riflescopes feature windage/elevation dials that will allow you to re-index the zero indicator after sight-in without disturbing your settings. This allows you to quickly return to your original zero if temporary corrections are used in the field. Reset the windage and elevation dials in this way:

1. Remove the outer cap and pull the adjustment dial outward against the spring tension until it stops.
2. With the dial pulled fully outwards, rotate the dial to reposition the zero mark on the index line.
3. Release the dial, allowing it to return to the normal inward position.



Grasp turret dial, pull upward and rotate until the etched **zero mark (arrow)** aligns with the indicator line on scope body.



MAINTENANCE

Cleaning

The fully waterproof and fogproof Vortex Viper HS riflescope requires very little routine maintenance other than periodically cleaning the exterior lenses. The exterior of the scope may be cleaned by wiping with a soft, dry cloth.

When cleaning the lenses, be sure to use products, such as the Vortex Fog Free cleaning products or Lens Pen, that are specifically designed for use on coated optical lenses.

- Be sure to blow away any dust or grit on the lenses prior to wiping the surfaces.
- Using your breath, or a very small amount of water or pure alcohol, can help remove stubborn things like dried water spots.

Lubrication

All components of the Vortex Viper HS riflescopes are permanently lubricated, so no additional lubricant should be applied.

Note: Other than to remove the turret caps, do not attempt to disassemble any components of the riflescope. Disassembling of riflescope may void warranty.

Storage

If possible, avoid exposing your Vortex riflescope to direct sunlight or any very hot location for long periods of time.

TROUBLESHOOTING

Sighting-in Problems

Many times, problems thought to be with the scope are actually mount problems. Be sure the mounts are tight to the rifle and the scope is secured so it doesn't twist or move in the rings.

An insufficient windage or elevation adjustment range may indicate problems with the base mount, base mount holes drilled in the rifle's receiver, or barrel/receiver alignment.

Check for Correct Base and Ring Alignment

- Re-center the scope reticle (see *Centering of the Reticle*).
- Attach bore sighter, or remove bolt and visually boresight rifle.
- Look through the scope. If the reticle appears way off center on the boresighter image or when compared to the visually centered target when looking through rifle's bore, there may be a problem with the bases or rings being used. Confirm that correct base and rings are being used—and in the proper orientation.

Grouping Problems

There are many issues that can cause poor bullet grouping.

- Maintain a good shooting technique and use a solid rest.
- Check that all screws on rifle's action are properly tightened.
- Be sure rifle barrel and action are clean and free of excessive oil or copper fouling.
- Check that rings are correctly torqued per the manufacturer's instructions.
- Some rifles and ammunition don't work well together—try different ammunition and see if accuracy improves.



VIPERHS
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THE VIP WARRANTY

We build optics based on our commitment to your absolute satisfaction. That's why Vortex products are unconditionally guaranteed.

Vortex pledges this Very Important Promise to you—a Very Important Person.

Our VIP unlimited, unconditional warranty covers your Viper HS riflescope in the event it requires service. No matter the cause, Vortex Optics will repair or replace the binocular at no charge to you.



Call Vortex Optics at 800-426-0048 for prompt, professional, and friendly service.

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Visit Vortex Optics at vortexoptics.com for more information.



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